October 15, 1990, Volume 197, Number 8

JOURNAL

OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

Bloomfield Horses, 1988

Joan Anderson

JOURNAL

OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

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Vol 197 October 15, 1990 No. 8
JAVMA 197 (8) 953-1104 (1990)
ISSN 0003-1488

Interpretive Summaries of Articles in This Issue 956

Letters

Comments on a multiple-choice ethics examination 962
Informing health officials of reportable diseases 962
Comments on the specialty of internal medicine 963
Misunderstanding about *Bibliography of Agriculture* 963

News

Concerns Facing the Profession—*Curbing hunger:* Veterinarians play role in global development 965
Regulatory Front—FDA-CVM asks for veterinary input on responsible compounding of drugs 967
Veterinary biologic issues addressed by USDA 967
Veterinarians Afield—US Army veterinarians stationed in Thailand 969
AVMA at Work—AVMA members sign up for long-distance phone discounts 973
Board convenes at convention 974
Food animal initiatives approved 976
Out and About—World Veterinary Congress planned for Rio de Janeiro 977
Washington Watch—Medical schools pay high price to counter animal rights activism 978
Standards for dogs and primates reproposed . 979
Convention Spotlight—Veterinary groups meet in San Antonio 980
Deaths 994

Editorial

Make your voice heard—*John B. McCarthy* .. 995

Pages from the Past

Blood transfusion: A historical review
Giselle Hosgood 998

Food for thought for food animal veterinarians

The veterinarian's role in animal welfare
John B. Herrick 1001

The *Human* Side of Veterinary Medicine

The veterinarian as victim
Jacob Antelyes 1003

Reports of Original Studies

Hyperkalemic periodic paralysis in horses
Sharon J. Spier, Gary P. Carlson, Terrell A. Holliday, George H. Cardinet, III, and Joel G. Pickar 1009

Distribution of equine infectious anemia in equids in southeastern United States
Martha Kathlynne Loftin, Jay F. Levine, Tom McGinn, and Leroy Coggins 1018

Patterns of uterine prolapse in dairy cows and prognosis after treatment—*Ian A. Gardner, James P. Reynolds, Carlos A. Risco, and David W. Hird* 1021

Comparison of the effect of pneumonia detected during lifetime with pneumonia detected at slaughter on growth in swine
Elizabeth P. Noyes, Daniel A. Feeney, and Carlos Pijoan 1025

Clinical Reports

Use of a liquid diet as the sole source of nutrition in six dysphagic horses and as a dietary supplement in seven hypophagic horses—*Raymond W. Sweeney and Thomas O. Hansen* 1030

Idiopathic granulomatous disease involving the skin in a horse—*Sebastian E. Heath, Roxy J. Bell, Edward G. Clark, and Deborah M. Haines* .. 1033

Granulosa cell tumor in a mare with a functional contralateral ovary—*Katrin Hinrichs, Elaine D. Watson, and Robert M. Kenney* 1037

Septicemia, atrial fibrillation, cardiomegaly, left atrial mass, and *Rhodococcus equi* septic osteoarthritis in a foal—*Chrysann Collatos, E. Susan Clark, Virginia B. Reef, and Debra Deem Morris* 1039

Congenital *Neospora caninum* infection in a calf with spinal cord anomaly—*J. P. Dubey, W. J. Hartley, and D. S. Lindsay* 1043

Prednisolone and danazol for treatment of immune-mediated anemia, thrombocytopenia, and ineffective erythroid regeneration in a dog—*S. A. Holloway, D. J. Meyer, and C. Mannella* 1045

Double cervices in two llamas—*E. B. Belknap, A. R. Schmidt, and C. L. Carleton* 1049

Prophylactic use of dantrolene associated with prolonged postanesthetic recumbency in a horse—*Alexander Valverde, Christie J. Boyd, Doris H. Dyson, and Peter J. Pascoe* 1051

Reports of Retrospective Studies

Cardiac arrhythmias identified in horses with duodenitis/proximal jejunitis: Six cases (1985-1988)—*Janyce L. Cornick and Thomas L. Seahorn* 1054

Accuracy of radiography of the reticulum for predicting surgical findings in adult dairy cattle with traumatic reticuloperitonitis: 123 cases (1981-1987)—*S. L. Fubini, A. E. Yeager, H. O. Mohammed, and D. F. Smith* 1060

What Is Your Diagnosis?

Lennox M. Ryland 1065

Book Review

Equine Endoscopy 1017

Abstracts of Selected Reports

Congenital malformations in sheep resulting from in utero inoculation of Cache Valley virus 1032

Use of inflammatory cell activities in bovine milk to diagnose mastitis 1048

Announcements

Coming Meetings 1067
Foreign Meetings 1068
Applications for Membership 1069
Certification Examinations 1070
State Board Examinations 1071
Educational Opportunities 1073

Classified Ads

..... 1083

Correction

In the August 15 issue of the JAVMA, the letter "Encourages new services to replace tube deworming" was not included in the Table of Contents. The letter appeared on pages 441–442. The JAVMA regrets the error.

Cover artist

Mrs. Joan Anderson is the wife of Dr. Raymon A. Anderson, a large-animal practitioner in Pierce, Neb.

Coming Soon . . .

November 1

Statistics Simplified—Study design (S. Shott)

Reflections—Give it your best shot (H. C. Nicoll)

Legal Brief—The liability potential for laboratory animal and public veterinarians (H. W. Hannah)

Topics in Drug Therapy—Pharmacologic features and physiologic effects of dopamine (G. Hosgood)

Special Commentary—Veterinary services for animal use in the United States: A conflict of paradigms (R. S. Ott)

Effect of nonthyroidal illness on serum thyroxine concentrations in cats (M. E. Peterson and D. A. Gamble)

Iatrogenic fractures of ribs and vertebrae during delivery in perinatally dying calves (G. Schuijt)

November 15

Special Commentary—Humane euthanasia and companion animal death: Caring for the animal, the client, and the veterinarian (L. A. Hart et al)

Food for thought for food animal veterinarians—What does organic mean? (J. B. Herrick)

Career Pathways in Veterinary Medicine—Biomedical Sciences Corps: A new look at the veterinarian's role in the Air Force (D. L. Jackson)

Food Animal Economics—Financial analysis of pseudorabies control and eradication in swine (C. A. Rodrigues et al)

Economic Note—Employment, starting salaries,and educational indebtedness of 1990 graduates of US veterinary medical colleges (J. K. Wise)

Serosurvey of horses with evidence of equine monocytic ehrlichiosis (Y. Rikihisa et al)

Heinz body hemolytic anemia associated with high plasma zinc concentration in a dog (P. J. Luttgen et al)

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SUBSCRIPTIONS: For one year: members $35; others $70 in the United States and possessions, $90 in foreign countries. Single copies: $6.00 in the United States and possessions, $8.00 in foreign countries.

Published semimonthly at 930 N Meacham Rd, Schaumburg, IL 60196, by the American Veterinary Medical Association. Second class postage paid at Schaumburg, Ill, and at additional mailing offices. Contents copyright 1990 by the AVMA.

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Distribution of equine infectious anemia in equids in southeastern United States

Martha Kathlynne Loftin, DVM; Jay F. Levine, DVM, MPH; Tom McGinn, DVM; Leroy Coggins, DVM, PhD

Summary: *State veterinarians in 11 southeastern states completed a questionnaire designed to determine the proportion of equids in the region that were seropositive for equine infectious anemia (EIA). Cases of EIA were diagnosed in each of the states surveyed. Distinct geographic clusters of cases were apparent in Tennessee and Kentucky adjacent to the Mississippi River, in the Piedmont of North Carolina at the Virginia border, in north central Georgia, and throughout the Florida peninsula. It is suggested that the national EIA program could be improved by standardization and wider application of uniform active surveillance measures, and improved documentation of EIA status of horses on acquisition and transfer records.*

Equine infectious anemia (EIA) is a disease with protean clinical manifestations that affects members of the genus *Equus*. A small percentage of affected equids develop fatal viremia; those that survive experience a chronic relapsing illness or become persistent carriers (without clinical signs of infection) of the virus.[1] The malady is caused by a retrovirus that has unique variable antigenic properties.[2] Transmission of the virus requires direct blood transfusion, either by biting insects or other mechanical vectors such as contaminated needles.[3] Equine infectious anemia has been associated with mortality in equids in Africa, Asia, Europe, and North and South America. In the United States, sporadic episodes of EIA have been recognized since 1896.[4]

In the United States, EIA is a reportable disease.[5] If an equid is seropositive for EIA, it is prohibited from crossing state lines without permission from federal and state authorities. The USDA maintains a record of all reported positive test results. The objectives of the study reported here were to determine the annual proportion of equids testing positive for EIA within southeastern United States between 1984 and 1987 and to compare intrastate control programs of the states within this region.

Materials and Methods

To obtain information about EIA testing activities, a questionaire was sent to state veterinarians in 11 southeastern states. Information that was obtained included the number of equids tested for EIA, the number seropositive for EIA, and the num-

Table 1—Cases of equine infectious anemia (EIA) in southeastern United States during 1984-1987

State	Year	Percentage of population tested*	EIA test results		
			No. tested	No. positive	Percent positive
Alabama	1985	0.07	6,399	44	0.52
	1986	0.11	19,145	67	0.35
	1987	0.18	22,183	114	0.51
Florida	1984	0.18	68,449	362	0.53
	1985	0.19	71,859	369	0.52
	1986	0.19	79,739	372	0.47
	1987	0.22	87,976	448	0.51
Georgia	1984	0.03	14,789	45	0.30
	1985	0.03	18,434	48	0.26
	1986	0.08	22,008	107	0.49
	1987	0.12	37,724	168	0.45
Kentucky	1987	0.02	63,347	68	0.11
Maryland	1984	<0.01	23,633	1	0.01
	1985	0.01	24,566	7	0.03
	1986	<0.01	22,902	2	0.01
	1987	0.01	24,122	5	0.02
Mississippi	1987	0.17	16,059	330	2.06
North Carolina	1984	<0.01	8,856	8	0.09
	1985	<0.01	9,556	4	0.04
	1986	<0.01	9,375	5	0.05
	1987	0.02	10,623	35	0.33
South Carolina	1984	0.03	7,578	25	0.33
	1985	0.02	7,591	15	0.20
	1986	0.01	7,974	8	0.10
	1987	0.02	5,630	18	0.32
Tennessee	1984	0.05	12,816	112	0.87
	1985	0.03	13,629	68	0.50
	1986	0.05	10,923	101	0.93
	1987	0.07	16,416	151	0.92
Virginia	1984	0.02	31,506	20	0.06
	1985	0.01	33,107	16	0.05
	1986	0.01	21,421	10	0.05
	1987	0.01	33,455	12	0.04
West Virginia	1984	<0.01	5,782	0	0.00
	1985	<0.01	6,150	1	0.02
	1986	<0.01	6,717	0	0.00
	1987	0.02	6,880	6	0.09

*Percentage of estimated equine population tested, base year 1987.

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Resources used to support this research were provided by the State of North Carolina.

We thank the state veterinarians for their cooperation in making this study possible.

Table 2—Breed distribution of EIA cases diagnosed in three southeastern states during 1984-1987

Breed	Alabama		Kentucky		North Carolina	
	No. of cases	Percent of total	No. of cases	Percent of total	No. of cases	Percent of total
Appaloosa	5	4.4	3	4.4	...	...
Grade	3	2.6	—	—	5	14.3
Mule	11	9.7	7	10.3	...	...
Quarter Horse	42	36.9	33	48.5	12	34.3
Saddlebred	2	1.7	13	19.1	...	...
Tennessee Walking Horse	7	6.1	2	2.9	5	14.3
Thoroughbred	2	1.7	1	1.5	12	34.3
Other	42	36.9	9	13.3	1	2.8
Total	114	100.0	68	100.0	35	100.0

ber of equids in the state during 1984-1987 (Table 1). In addition, the breed, gender, and age of each equid tested were requested. A copy of each state's current intrastate law and enforcement policy with the date they took effect also was obtained.

The proportion of equids testing positive for EIA in each state was calculated for each year information was provided. The states were classified as having active, passive, or no intrastate law regulating control of EIA. Active intrastate laws were defined as laws that were enforced to some degree by state officials or accredited veterinarians. Passive laws were defined as laws that were enforced principally by the industry. The association between the magnitude of regulatory efforts and the number of EIA cases reported was evaluated.

Results

Eleven questionnaires were distributed; all were returned. Ten states provided information about the actual number of new cases diagnosed (Table 2). One state, Florida, did not differentiate between previous known reactors that were retested and new cases of EIA. The surveillance data collected were incomplete; Mississippi and Kentucky did not have EIA case information prior to 1987, and Alabama did not compile case information during 1984. Alabama, Kentucky, and North Carolina provided specific demographic case data for 1987. Equine population figures were provided by each state; however, the manner in which census information was obtained was variable.

Equine infectious anemia was diagnosed in equids in each of the states surveyed (Table 1). The proportion of equids testing positive for EIA was greatest in Mississippi, where 2% of those tested seropositive, but did not exceed 1% in the other states. North Carolina was the only state that had an obvious increase in the proportion of cases, which ranged from < 0.05% in the years prior to 1987 to 0.33% in 1987. Testing activity steadily increased in Alabama, Florida, and Georgia over the 4-year period; little fluctuation in testing activity was evident in the remaining states.

Equine infectious anemia was widely reported throughout the Southeast (Fig 1). Clusters of more than 10 cases were evident in 6 states. Prominent foci of cases were evident in western Kentucky and

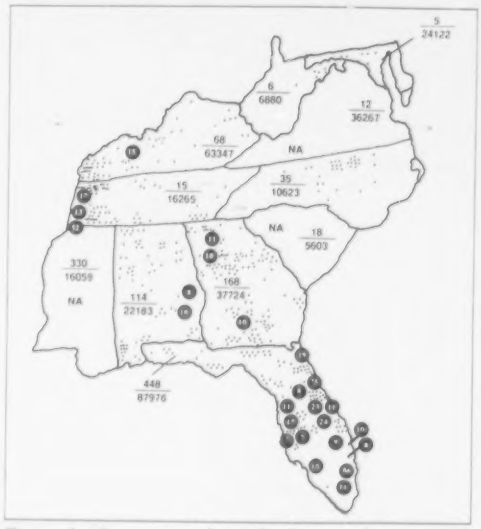

Figure 1—Proportion of equids that tested positive for equine infectious anemia (equids testing positive by the agar gel immunodiffusion test/No. of equids tested) during 1987 in 11 southeastern states. Black circles represent clusters of seropositive equids reported from one locality. NA = Map not available.

Tennessee in counties bordered by the Mississippi River, in the Piedmont area of North Carolina at its Virginia border, in northwestern Georgia, and in south central and northeastern corners of Flordia.

The laws governing the control of EIA in the Southeast varied from state to state. Alabama, Flordia, Georgia, Maryland, Kentucky, and Virginia had active intrastate laws. Since November 1981, Alabama has had an active intrastate law aimed at controlling the spread of EIA. Proof of EIA seronegative status was monitored at state fairs, auctions, and roadside. Florida has had an active intrastate policy for the control of EIA since October 1973. Test results were examined by state officials at the state lines and prior to participation in shows, fairs, and horse auctions. Since January 1987, Georgia required that negative EIA test results accompany each equid to shows, rodeos, trail rides, and public boarding and training facilities. Blood samples were drawn from equids at auctions if proper proof of seronegative status was not available. Kentucky's control program focused on auctions and fairs. Equids sold at consignment auctions were serologically tested prior to being sold. Sale barns were approved on the basis of ability to keep accurate records of the origin and destination of each equid. Blood samples were obtained from equids at these auctions. Maryland's control program was revised in January 1987 and provided for stricter control of auction markets. Since November 1985, Virginia has required that auctions employ a licensed veterinarian to collect blood samples to be submitted for EIA testing.

South Carolina and West Virginia had passive intrastate laws focusing on auctions and fairs. South

Carolina's law has been in effect since February 1978. Most of the enforcement was handled by the industry; however, state veterinarians have worked with the highway patrol to decrease the interstate transportation of equids into the state without proper proof of negative EIA status. West Virginia's law has been in effect since 1987 and has depended on industry compliance for enforcement. Neither Mississippi, North Carolina, nor Tennessee had an intrastate control program.

State veterinarians from Alabama, Kentucky, and North Carolina provided information about individual cases identified in 1987. Quarter Horse was the most frequently affected breed (Table 2). The age and gender of equids with EIA were provided by Alabama and Kentucky, but were not routinely recorded by other state agencies.

Discussion

Equine infectious anemia continues to be sporadic within the United States and has been diagnosed in all but 5 states.[6] In 1973, EIA became a reportable disease in the United States.[4] The national program is limited to the control of interstate trafficking of reactors. State regulatory agencies have retained the responsibility for testing and case surveillance. The monitoring strategies used have not been standardized, and this variation impedes efforts to assess the actual prevalence of the disease in the United States. In Canada, a national control program was instituted in 1971. Equids were tested on an owner voluntary basis unless the disease was suspected, at which time testing became mandatory. Diminished spread of the disease was attributed to this active program.[7]

Within each state, the proportion of equids testing positive by use of the agar gel immunodiffusion test provides a crude estimate of the number of equids with EIA. However, it is impossible to determine when these equids became infected. In addition, the USDA's system of data collection does not account for the number of equids that have been retested and further clouds the ability to accurately determine the prevalence of the disease. In this study, testing activity, as a percentage of the equine population, increased in Alabama and Florida over the 4-year period. In North Carolina, the relative percentage of equids testing positive increased during 1984 through 1987. This increase possibly represents an artifact of testing and case surveillance efforts. Recognition of one clinical case precipitates increased levels of testing in areas in which equids would not have been screened otherwise, and the reverse also may be true. If high-risk populations are not included in a surveillance program, episodes of EIA may be missed.

Cases were broadly distributed throughout the states surveyed. Obvious trends did not exist in the number tested or number of cases relative to state laws. Most cases reported were in equids ≥ 8 years old; however, insufficient case and population information was available to accurately assess the age distribution of affected and nonaffected equids. In a Canadian study conducted during 1981, age of seropositive equids was 7 to 8.5 years.[7] Mean age of seropositive equids intuitively reflects the chronicity of EIA virus infection, but may simply reflect the actual age distribution of equids in the Southeast and the Canadian study area.

Equine infectious anemia is a disease that can cause devastating economic and personal losses.[4] Standardization of record keeping between states would eliminate some of the current problems that impede efforts to assess the effectiveness of EIA control programs and facilitate further characterization of the distribution of the disease. Specific recording changes that would improve program evaluation include: differentiating between equids tested for the first time and those being retested; adaptation of a uniform test chart; recording the reason for testing (eg, sale); and recording the geographic location of cases in individual counties and on farm premises. Demographic information about known reactors and nonreactors within the same geographic area would provide useful information for evaluating the risk factors that predispose equids to infection.

Continued case surveillance is needed to document the temporal and spatial distribution of EIA. The national EIA program could be improved by adopting uniform active surveillance at all public horse events, sales, and auctions by each state, documenting EIA status prior to transfer of equid ownership, and acquiring the site-specific case information needed to assess the geographic distribution of EIA. A national equine census would provide accurate population data for estimating local incidence of EIA and monitoring its spread. The successful implementation of control measures to minimize the impact of the disease on the equine population will ultimately be determined by the support offered by the equine industry and the effectiveness of state surveillance activities.

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